

WHAT IS CLAIMED IS:

1. A method of removing false contours in a pulse number modulation (PNM) digital display device, in which predetermined pixel data processed in a current frame (hereinafter, referred to as input data) is compared with corresponding pixel data in a previous frame (hereinafter, referred to as comparison data), wherein it is determined, based on a result of the comparison, whether or not false contours have occurred, and the input data is modulated and output so that the false contours can be removed, the method comprising:

- a) comparing the input data with the comparison data and calculating a plurality of possible output data in consideration of an index error between the input data and error-diffused input data so that the false contours can be removed, the error-diffused input data being obtained by diffusing a quantization error that has occurred in pixels adjacent to the input data in the current frame;
- b) detecting an index error between the input data and the error-diffused input data; and
- c) selecting one from among the plurality of possible output data obtained in a) in consideration of the index error detected in b).

2. The method of claim 1, wherein the index error corresponds to a difference between an index of a subfield illumination pattern corresponding to the input data (hereinafter, referred to as an input index) and an index of a subfield illumination pattern corresponding to the comparison data (hereinafter, referred to as a comparison index).

3. The method of claim 1, further comprising:
d) diffusing a quantization error that has occurred in pixels adjacent to the input data in a previous line of the current frame to the input data.

4. The method of claim 3, further comprising:
e) diffusing a quantization error that has occurred in pixels adjacent to the input data in a current line of the current frame to a result of the error diffusion carried out in d),
wherein in b), an index error between the input data and the error-diffused input data obtained by carrying out d) and e) is detected.

5. The method of claim 1, wherein subfield illumination patterns are classified into a plurality of groups depending on their similarity to one another, and in c), indexes belonging to the same group as the comparison index are selected and output.

6. The method of claim 5, wherein if there are more than one of the indexes belonging to the same group as the comparison index, a closest index to the input index is selected and output.

7. An apparatus for removing false contours in a PNM digital display device, which compares pixel data currently being processed in a current frame (hereinafter, referred to as input data) with corresponding pixel data in a previous frame (hereinafter, referred to as comparison data), determines, based on a result of the comparison, whether or not false contours have occurred, and modulates and outputs the input data so that the false contours can be removed, the apparatus comprising:

a quantization and output data unit which compares the input data with the comparison data and calculates a plurality of possible output data in consideration of an index error between the input data and error-diffused input data so that the false contours can be removed, the error-diffused input data being obtained by diffusing a quantization error that has occurred in pixels adjacent to the input data in the current frame;

an error detection unit which detects an index error between the input data and the error-diffused input data; and

a multiplexing unit which selects one from among the plurality of possible output data obtained by the quantization and output data unit in consideration of the index error detected by the error detection unit.

8. The apparatus of claim 7 further comprising:

a first error diffusion filtering unit which diffuses a quantization error that has occurred in pixels adjacent to the input data in a previous line of the current frame to the input data.

9. The apparatus of claim 8 further comprising:

a second error diffusion filtering unit which diffuses a quantization error that has occurred in pixels adjacent to the input data in a current line of the current frame to a result of the error diffusion carried out by the first error diffusion filtering unit,

wherein the error detection unit detects an index error between the input data and the error-diffused input data obtained by the first and second error diffusion filtering units.

10. A method of removing false contours in a pulse number modulation (PNM) digital display device, in which pixel data processed in a current frame (hereinafter, referred to as input data) is compared with corresponding pixel data in a previous frame (hereinafter, referred to as comparison data), wherein it is determined, based on a result of the comparison, whether or not false contours have occurred, and the input data is

modulated and output so that the false contours can be removed, the method comprising:

- a) diffusing a quantization error that has occurred in pixels adjacent to the input data in different scan lines of the current frame from a scan line that the input data belongs to;
- b) preparing a plurality of output data for compensating for possible false contours by comparing the input data with the comparison data;
- c) detecting a false contour error between the input data and error-diffused input data; and
- d) selecting one from among the plurality of output data based on the detected false contour error.

11. The method of claim 10, wherein the index error corresponds to a difference between an index of a subfield illumination pattern corresponding to the input data (hereinafter, referred to as an input index) and an index of a subfield illumination pattern corresponding to the comparison data (hereinafter, referred to as a comparison index).

12. The method of claim 10 further comprising:

e) diffusing a quantization error that has occurred in pixels adjacent to the input data in the same scan line of the current frame as the scan line that the input data belongs to, to a result of the error diffusion carried out in a), wherein in step c), a false contour error between the input data and the error-diffused input data obtained by carrying out a) and e).

13. A computer readable medium including a computer program having instructions that when executed, are operable to remove false contours in a pulse number modulation (PNM) digital display device, the instructions operable for:

- a) comparing input data with comparison data and calculating a plurality of possible output data in consideration of an index error between the input data and error-diffused input data so that the false contours can be removed, the error-diffused input data being obtained by diffusing a quantization error that has occurred in pixels adjacent to the input data in a current frame;
- b) detecting an index error between the input data and the error-diffused input data; and
- c) selecting one from among the plurality of possible output data obtained in a) in consideration of the index error detected in b).

14. A computer readable medium including a computer program having instructions that when executed, are operable to remove false contours in a pulse number modulation (PNM) digital display device, the instructions operable for:

- a) diffusing a quantization error that has occurred in pixels adjacent to input data in different scan lines of a current frame from a scan line that the input data belongs to;
- b) preparing a plurality of output data for compensating for possible false contours by comparing the input data with the comparison data;
- c) detecting a false contour error between the input data and error-diffused input data; and
- d) selecting one from among the plurality of output data based on the detected false contour error.